APPENDIX K

DEAD CREEK CADMIUM SOIL LEACHING INVESTIGATION INFORMATION



DEAD CREEK SOIL-GROUNDWATER LEACHING INVESTIGATION

SAUGET AREA 1 SAUGET AND CAHOKIA, ILLINOIS

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1.0 INTRODUCTION

This report summarizes the Dead Creek Soil to Groundwater Leaching Investigation activities performed at the Sauget Area 1 site in Sauget, Illinois during July 2007. The work was performed in accordance with the Sauget Area 1 – Revised Sampling Plan for Dead Creek Soil-Groundwater Leaching Investigation Work Plan dated April 27, 2007. This plan was approved by the U.S. Environmental Protection Agency (USEPA) on May 24, 2007. Any deviations from the Work Plan are identified and discussed in the report.

Groundwater samples were collected on July 10 and 11, 2007 from four temporary wells installed in each of Creek Segments C, D, E, and F. The temporary wells were located downgradient of the location of the transect in each creek segment where the highest concentration of cadmium was detected during sampling performed in 2002 immediately following removal of the creek bottom sediments (Figures 1 and 2). The temporary wells were installed on July 9, 2007 and were subsequently removed following sampling. This report summarizes the work performed during the investigation.

2.0 GROUNDWATER SAMPLING ACTIVITIES

2.1 Soil Borings

Roberts Environmental Drilling Inc. (REDI) advanced four boreholes and installed temporary wells at four locations west of Dead Creek on July 9, 2007, under the direct supervision of Golder Associates Inc. (Golder). The field work was also observed on a full time basis by a representative of CH2M Hill, the USEPA oversight contractor.

The boreholes were advanced at the following locations:

- Transect-T7 at Dead Creek Segment C (CSC-T7), temporary well 7
- Transect-T2 at Dead Creek Segment D (CSD-T2), temporary well 2
- Transect-T16 at Dead Creek Segment E (CSE-T16), temporary well 16
- Transect-T6 at Dead Creek Segment F (CSF-T6), temporary well 6

The four soil borings were advanced using direct-push technology (DPT) with a Geoprobe® 6610 series track-mounted rig. Samples were collected for lithologic logging as the boreholes were advanced with 2-inch macrocore sample barrels. The boreholes were advanced until groundwater was encountered as indicated in the soil samples and were terminated approximately five feet below the water table.

Soil samples were continuously collected in 4-foot intervals and classified by Golder personnel according to the Unified Soil Classification System (USCS). All soil from each borehole was collected in 5-gallon plastic buckets and was transferred to a labeled 55-gallon drum located at the Judith Lane facility.

2.2 Temporary Well Installation

A temporary well was installed at each boring location. Installation consisted of placing a five-foot long, ¾-inch diameter, flush-threaded 0.010-inch slotted schedule 40 PVC pre-packed well screen through the Geoprobe® rods. The screen was pushed to a depth of at least five feet below the groundwater table and the rods were slowly withdrawn from the borehole to expose the screen to the groundwater. In order to reduce the turbidity of the samples, silica sand was poured to a depth approximately two feet above the top of the well screen to create a filter pack and bentonite pellets were then placed to the ground surface. A riser pipe constructed of ¾-inch diameter schedule 40 PVC extended the temporary wells above ground surface.

Temporary well T6 was offset approximately 150 feet west of CSF-T6 due to inaccessibility issues caused by dense woods and underbrush. Temporary well T16 was offset approximately 50 feet west of CSE-T16 because an apartment complex is located on the edge of Dead Creek and there is no room for drilling equipment between the structure and the creek at the location of Transect T16. The CH2M Hill representative was present when these locations were selected and accepted the need to offset them from the creek bank. The other two temporary wells were located on the crest of the bank, approximately one to five feet from the edge of the bank. The locations of the temporary wells are shown on Figures 1 and 2.

2.3 Groundwater Sampling

Golder conducted groundwater sampling at the four temporary wells on July 10 and 11, 2007. A total of twelve (12) groundwater samples were collected immediately below the water table through dedicated polyethylene tubing using a low flow, peristaltic pump. The wells were purged and water quality parameters (pH, temperature, specific conductivity, and turbidity) were measured and recorded during purging. Purging continued until all the parameters had stabilized for three consecutive readings and the turbidity was approximately 10 NTUs or lower.

Both filtered and unfiltered samples were collected for cadmium analyses. Two filtered samples were collected at each sampling location. One sample was passed through a 10 micron filter, while the other was passed through a 0.45 micron filter. This allowed the measurement of total cadmium concentrations (unfiltered samples), as well as the colloidal (10-micron filtered samples) and dissolved (0.45-micron filtered samples) concentrations. All the filtration was done using in-line filters to avoid exposure of the samples to air. Groundwater samples were preserved on ice and sent to Test America in Savannah, Georgia for analysis (formerly Savannah Laboratories).

All samples were collected and analyzed using the methods, procedures and protocols included in the Sauget Area 1 EE/CA and RI/FS Support Sampling Plan, Field Sampling Plan and Quality Assurance Project Plan approved by the USEPA on September 9, 1999. The groundwater samples were analyzed for cadmium using USEPA SW-846 Method 3550/6020.

Purge water collected during sampling from each borehole was stored in 5-gallon plastic buckets and transferred to a labeled 55-gallon drum located at the Judith Lane facility.

2.4 Temporary Well Abandonment

Following sampling of the four temporary wells, removal of the riser pipe and screen, as required by the approved Work Plan, proved unsuccessful in three of the four installations due to the settling of the bentonite pellets and sand around the screen and riser pipe. The uppermost section of the riser pipe from T6, T2 and T16 was removed and the remainder of the hole was filled with hydrated bentonite pellets. The pre-packed screen in temporary well T7 was removed and the borehole was filled with bentonite pellets. Final abandonment of T16 consisted of an asphalt patch to match the existing asphalt in the parking lot. All personal protective equipment and expendable well materials that were accumulated throughout the investigation activities were transferred to a labeled 55-gallon drum at the Judith Lane facility.

3.0 GROUNDWATER SAMPLING RESULTS

3.1 Data Validation Results

As mentioned, twelve (12) samples were collected using a low flow, peristaltic pump. Two field duplicates were also collected, as was a matrix spike/matrix spike duplicate (MS/MSD) which was collected with sample MW-T16-UNF. Samples were analyzed for cadmium, using the methods, procedure, and protocols included in the Sauget Area 1 EE/CA and RI/FS Support Sampling Plan, Field Sampling Plan and Quality Assurance Project Plan approved by USEPA on September 9, 1999.

Data validation was performed following the general guidelines of Section 9.2 of the "Quality Assurance Project Plan, Sauget Area 1 Support Sampling Project, Sauget and Cahokia, Illinois, Volume 2". A summary of the validated analytical results is included in Table 1, and laboratory analytical reports are attached as Appendix B. Data validation reports are attached as Appendix C.

There was one minor concern about some of the samples that required qualification of the results because the serial dilution was not within a 10% difference (%D) of the original determination after correction for dilution. Requirements for acceptable instrument calibration are established to ensure the instrument is capable of generating satisfactory data. The USEPA functional guidelines for data evaluation require that if the analyte concentration is sufficiently high (50 times the Method Detection Limit (MDL)), the serial dilution analysis should be within 10% of the original determination after correction for dilution. In accordance with the functional guidelines, results that were greater than, or equal to the MDL, were qualified as estimated values (J) and non-detects were also qualified as estimated values (UJ). Samples MW-T2-UNF, MW-T2-10, MW-T2-0.45 were qualified with J flags, while samples MW-T6-10 and MW-T6-0.45 were qualified with UJ flags, based on a review of serial dilution. No data were rejected.

Where a positive result was qualified as estimated, the analyte should be considered present. Similarly, a detected or non-detected result, which was qualified as an estimated reporting limit, should be considered not present for the purposes of this program, although the limit itself may not be precise. The completeness for the entire data set was 100%.

3.2 Discussion of Results

Groundwater sample results for each temporary well are presented below for the filtered and unfiltered fractions along with the temporary well location and the cadmium concentrations in soil samples obtained in 2002 (2002 soil samples collected from soil remaining in Dead Creek following the removal action):

Creek Segment and Sample ID	Location	2002 Concentration (mg/kg)	Unfiltered Conc. (mg/L)	Filtered Conc. (10 µm) (mg/L)	Filtered Conc. (0.45µm) (mg/L)
C-MW-T7	Approx. one foot from bank at T-7	25 J	0.00024 J	0.00016 J	0.00017 J
D-MW-T2	Approx. one foot from bank at T-2	40 J	0.00056 J	0.00051 J	0.00058 J
E-MW-T16	50 ft. west of bank at T-16	38 J	0.00013 J	0.00014 J	0.00050 U
F-MW-T6	150 ft. west of bank at T-6	70	0.00015 J	0.00050 UJ	0.00050 UJ

J - Denotes an estimated concentration

Bold text denotes compound detected at a concentration in excess of the detection limit

Examination of the results in the preceding table shows that there is no significant difference between filtered and unfiltered cadmium concentrations in any of the samples. In each of the samples, the detections in each fraction (unfiltered, colloidal, and dissolved) were within 0.0001 mg/L of other samples from the same well. Results for each individual monitoring well are discussed below:

- In MW-T7 (Creek Segment C), cadmium was detected in all three samples. Cadmium concentrations in the unfiltered sample were greatest (0.00024 mg/L) and were similar in the filtered samples (0.00016 and 0.00017 mg/L, respectively). The very small differences in the concentrations in the three sample fractions make meaningful comparisons difficult.
- In MW-T2 (Creek Segment D), cadmium concentrations were also similar in all three samples. Based on these results, it appears that the cadmium in these samples was primarily dissolved in groundwater.
- In MW-T16 (Creek Segment E), cadmium concentrations were similar in the unfiltered and colloidal fractions, but was not detected in the dissolved phase. These results demonstrate that cadmium is primarily associated with colloidal sized material at this location.

U - Compound not detected

• In MW-T6 (Creek Segment F), cadmium was only detected in the unfiltered sample, indicating that it was associated with particulate matter suspended in the sample and is not mobile in the groundwater.

The other point to be noted about the results summarized in the table is that the cadmium concentrations in samples from all of the wells are very similar, with the sample concentrations in well MW-T2 being marginally higher than the others. Given these similarities, it is reasonable to expect that the results obtained from the wells in Creek Sectors E and F are representative of conditions immediately downgradient of the creek, despite the fact that these wells were not immediately adjacent to the creek.

Transects with the highest cadmium concentrations in soil were selected in each creek segment for the leaching to groundwater investigation. Since all groundwater results (both filtered and unfiltered) were below the Illinois Class I groundwater protection standard of 0.005 mg/L, the results of this investigation demonstrate that cadmium leaching from soils in the creek bottom does not present an issue for shallow groundwater quality. The cadmium concentrations detected in all groundwater samples (both filtered and unfiltered fractions) were all less than 0.001 mg/L and three of the four temporary wells contained cadmium at concentrations that are less than five percent of the Illinois Class I groundwater protection standard of 0.005 mg/L. As explained in the USEPA-approved Sampling Plan for the Investigation, in creek Sectors C through F, constituents other than cadmium were demonstrated to not be of concern for leaching to groundwater based on concentrations remaining in creek bottom soils. This investigation has demonstrated that, in addition, cadmium is not of concern for leaching to groundwater.

4.0 SIGNATURES

Please contact us if you have any questions regarding this work or require additional information.

Sincerely,

GOLDER ASSOCIATES INC.

-signature in original hard copy-

Amanda W. Gilbertson, Ph.D. Staff Environmental Engineer

-signature in original hard copy-

Mike S. Lemon, P.E., R.G. Project Engineer

-signature in original hard copy-

Frederick M. Booth, P.G. Senior Consultant, Principal

TABLES

Summary of Validated Groundwater Sample Detections - Inorganics (July 2007 Sampling Event) Dead Creek Soil-Groundwater Leaching Investigation Sauget Area 1

Solutia, Inc. - Sauget, Illinois

Monitoring Well		MW-T2-UNF	MDL	MW-T2-10	MDL	MW-T2-0.45	MDL	MW-T6-UNF	MDL	MW-T6-10	MDL	MW-T6-0.45	MDL
Lab Sample ID	680-28339-7		680-28339-8		680-28339-9		680-28339-11		680-28339-12		680-28339-13		
Date Sampled	7/11/2007		7/11/2007		7/11/2007		7/11/2007		7/11/2007		7/11/2007		
Time Sampled	11:25		11:30		11:35		15:10		15:15		15:20		
Metals (USEPA Method 6020)													
Date Prepared		7/19/2007		7/19/2007		7/19/2007		7/19/2007		7/19/2007		7/19/2007	
Date Analyzed		7/21/2007		7/21/2007		7/21/2007		7/21/2007		7/21/2007		7/21/2007	
Analyte	CAS No.	(mg/L	.)	(mg/l	_)	(mg/l	_)	(mg/L)	(mg/L	.)	(mg/L	.)
Cadmium	7440-43-9	0.00056 J	0.00012	0.00051 J	0.00012	0.00058 J	0.00012	0.00015 J	0.00012	0.00050 UJ	0.00012	0.00050 UJ	0.00012

Parameters not listed were not detected in any samples. Results in **bold italics** denote detections.

mg/L - milligrams per Liter MDL - Method Detection Limit

Flags and Qualifiers

U - Analyte was not detected at or

above the Method Detection Limit (MDL).

J - Result is an estimated value.

The concentration is an approximate value.

Date: 8/30/07 Checked by: JAP Reviewed by: AWG Date: 8/31/07

> 1 of 2 Golder Associates

Summary of Validated Groundwater Sample Detections - Inorganics (July 2007 Sampling Event) Dead Creek Soil-Groundwater Leaching Investigation Sauget Area 1

Solutia, Inc. - Sauget, Illinois

Monitoring Well		MW-T7-UNF	MDL	MW-T7-10	MDL	MW-T7-0.45	MDL	MW-T16-UNF	MDL	MW-T16-10	MDL	MW-T16-0.45	MDL
Lab Sample ID	680-28339-1		680-28339-2		680-28339-3		680-28339-4		680-28339-5		680-28339-6		
Date Sampled		7/10/2007		7/10/2007		7/10/2007		7/11/2007		7/11/2007		7/11/2007	
Time Sampled	<u>.</u>	12:50		12:55		13:00		9:20		9:25		9:30	
Metals (USEPA Method 6020)													
Date Prepared		7/19/2007		7/19/2007		7/19/2007		7/19/2007		7/19/2007		7/19/2007	
Date Analyzed		7/21/2007		7/21/2007		7/21/2007		7/21/2007		7/21/2007		7/21/2007	
Analyte	CAS No.	(mg/L)	(mg/L	_)	(mg/L))	(mg/L))	(mg/l	L)	(mg/L))
Cadmium	7440-43-9	0.00024 J	0.00012	0.00016 J	0.00012	0.00017 J	0.00012	0.00013 J	0.00012	0.00014 J	0.00012	0.00050 U	0.00012

Parameters not listed were not detected in any samples.

Results in **bold italics** denote detections.

mg/L - milligrams per Liter MDL - Method Detection Limit

Flags and Qualifiers

U - Analyte was not detected at or

above the Method Detection Limit (MDL).

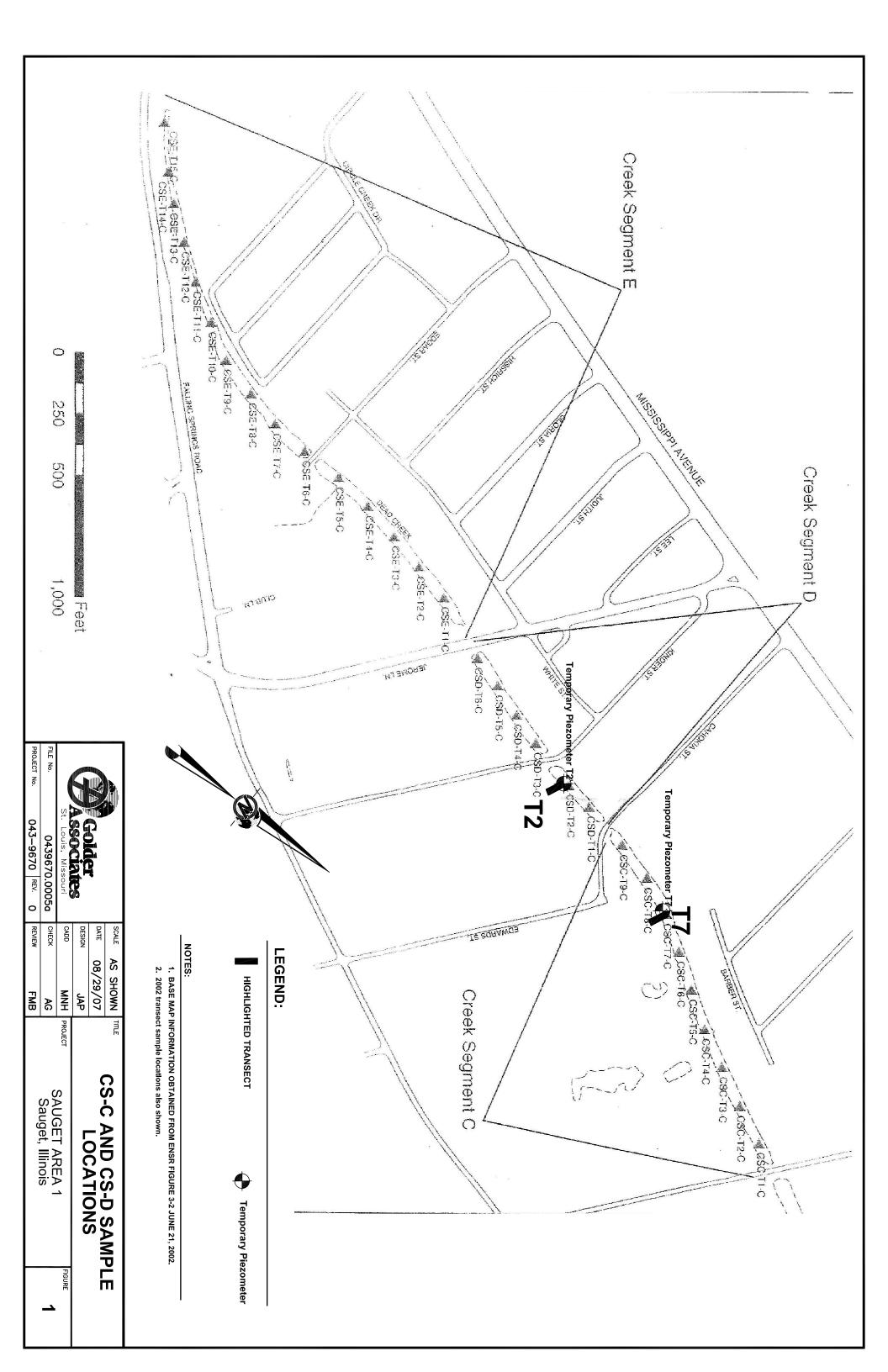
J - Result is an estimated value.

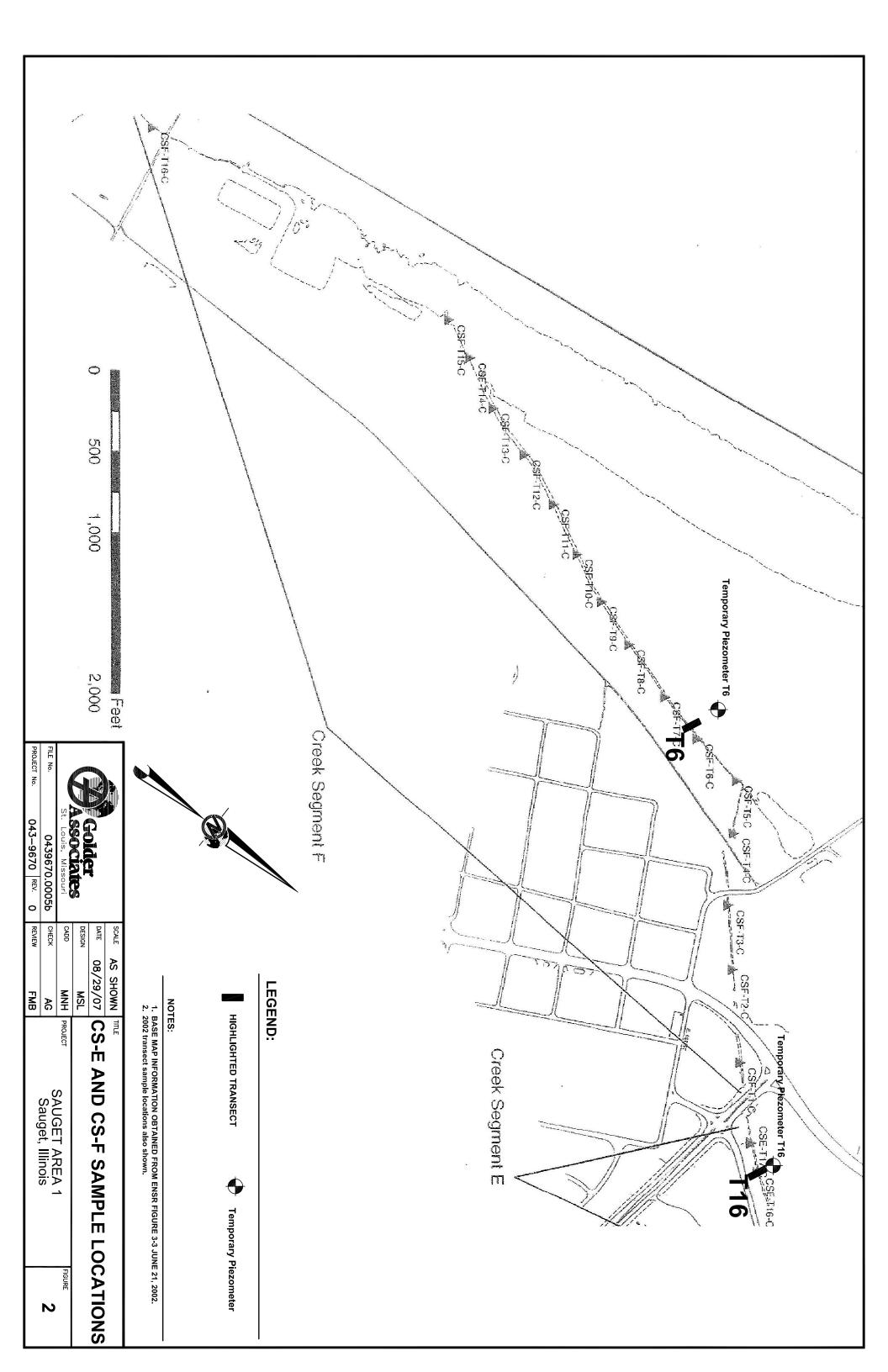
The concentration is an approximate value.

Checked by: JAP Date: 8/30/07 Date: 8/31/07 Reviewed by: AWG

> 2 of 2 Golder Associates

FIGURES





APPENDICES

APPENDIX A

TEMPORARY WELL BORING LOGS, FIELD PURGING RECORDS & FIELD NOTES

LOG OF GEOPROBE BOREHOLE



INVESTIGATION AREA Creek Segment D,	DRILLER Joe Cox		START	FINISH
Transect T2, West of Dead Creek	RIG 6610 Delta T	DATE	7/9/07	7/9/07
	NO. SAMPLES 4	TIME	10:45	11:25
TOTAL DEPTH 16.0 feet Below Ground Surface (BGS)	LOCATION Dead Creek,	BACKFILL TYPE	Bentonite	Pellets
BOREHOLE DIAM. 2.5 inches	Cahokia, Illinois	-		

DEPTH	SAMPLE	PID		1	<u> </u>
(Feet)	No.	(ppm)	RECOVERY	OTHER	DESCRIPTION AND COMMENTS
	1	0.0	2.9/4.0		0.0-2.0 Firm, dark yellowish brown (10YR 4/2), SILT, trace organics, damp, (ML) 2.0-5.8 Compact, moderate yellowish brown (10YR 5/4), fine grained SILTY SAND, dry to damp, (SW)
8	2	0.0	3.3/4.0		5.8-7.0 Firm, moderate yellowish brown (10YR 5/4) with dark gray (N3) mottling, <u>CLAYEY SILT</u> , damp, (MH) 7.0-7.6 Loose, moderate yellowish brown (10YR 5/4), fine grained <u>SAND</u> , damp, (SP)
12	3	0.0	3.0/4.0	▼ 10.13 7/9/07 11:25	7.6-9.0 Soft, dark yellowish brown (10YR 4/2), fine grained SANDY SILT, moist, (SM) 9.0-9.2 Loose, moderate yellowish brown (10YR 5/4), fine grained SAND, damp, (SP) 9.2-10.2 Firm, moderate yellowish brown (10YR 5/4) with dark gray (N3) mottling, CLAYEY SILT, damp, (MH)
16	4	0.0	3.2/4.0		10.2-13.8 Compact, dark yellowish brown (10YR 4/2), very fine grained SILTY SAND, wet, (SW) 13.8-14.0 Compact, dark yellowish brown (10YR 4/2), very fine grained SAND, wet, (SW) 14.0-16.0 Compact, brownish gray (5YR 4/1), fine grained SAND, wet, (SP)

END OF BOREHOLE @ 16.0 FEET BGS

PROJECT No	043-9670	LOGGED BY	MSL
PROJECT	Dead Creek Soil to Groundwater Leaching Investigation	CHECKED BY	MSL
LOCATION	Cahokia, Illinois	REVIEWED BY	8/3/2007

LOG OF GEOPROBE BOREHOLE



INVESTIGATION AREA Creek Segment F,	DRILLER Joe Cox		START	FINISH
Transect T6, West of Dead Creek	RIG 6610 Delta T	DATE	7/9/07	7/9/07
	NO. SAMPLES 4	TIME	09:12	10:30
TOTAL DEPTH 14.0 feet Below Ground Surface (BGS)	LOCATION Dead Creek,	BACKFILL TYPE	Bentonite	Pellets
BOREHOLE DIAM. 2.5 inches	Cahokia, Illinois			

DEPTH (Feet)	SAMPLE No.	PID (ppm)	RECOVERY	OTHER	DESCRIPTION AND COMMENTS
	1	0.0	3.5/4.0		0.0-1.6 Soft, moderate yellowish brown (10YR 5/4), CLAYEY SILT, damp, (MH) 1.6-2.5 Firm, moderate yellowish brown (10YR 5/4), SILTY CLAY, damp, (CL)
4					2.5-2.9 Loose, light brown (5YR 6/4), fine grained <u>SAND</u> , damp,
8	2	0.0	3.1/4.0		(SP) 2.9-5.9 Soft, moderate yellowish brown (10YR 5/4), SILT, trace fine grained sand, some clay, damp, (ML) 5.9-9.8 Loose, moderate yellowish brown (10YR 5/4), fine grained SAND, wet, (SP)
	3	0.0	3.6/4.0	9.80 7/9/07 10:35	9.8-10.7 Soft, light gray (N7), <u>CLAY</u> , damp, (CH) 10.7-14.0 Loose, moderate yellowish brown (10YR 5/4), <u>SAND</u> ,
12					wet, (SP)
14	4	0.0	2.0/2.0		

END OF BOREHOLE @ 14.0 FEET BGS

PROJECT No	043-9670	LOGGED BY	MSL
PROJECT	Dead Creek Soil to Groundwater Leaching Investigation	CHECKED BY	MSL
LOCATION	Cahokia, Illinois	REVIEWED BY	8/3/2007

LOG OF GEOPROBE BOREHOLE



INVESTIGATION AREA Creek Segment C,	DRILLER Joe Cox		START	FINISH
Transect T7, West of Dead Creek	RIG 6610 Delta T	DATE	7/9/07	7/9/07
	NO. SAMPLES 4	TIME	14:45	15:40
TOTAL DEPTH 16.0 feet Below Ground Surface (BGS)	LOCATION Dead Creek,	BACKFILL TYPE	Bentonite	Pellets
BOREHOLE DIAM. 2.5 inches	Cahokia, Illinois			

DEPTH	SAMPLE	PID								
(Feet)	No.	(ppm)	RECOVERY	OTHER	DESCRIPTION AND COMMENTS					
	1	0.0	3.1/4.0		0.0-1.8 Firm, dark yellowish brown (10YR 4/2), SILTY CLAY, trace organics, (CL) 1.8-10.4 Soft, moderate yellowish brown (10YR 5/4) with dark					
4					yellowish brown (10YR 4/2) mottling, <u>SANDY SILT</u> , damp, (ML)					
8	2	0.0	3.0/4.0	<u>▼</u> 7.60	@5.5 Wet					
Ü	3	0.0	4.0/4.0	7/9/07 15:40	7/9/07	10.4-11.0 Stiff, light gray (N7), SILTY CLAY, damp, (CL)				
12	3	0.0	4.0/4.0	4.0/4.0	4.0/4.0	4.0/4.0	4.0/4.0	4.0/4.0		11.0-13.6 Soft, moderate yellowish brown (10YR 5/4), <u>CLAYEY SILT</u> , trace fine sand, wet, (MH)
	4	0.0	4.0/4.0		13.6-15.6 Loose, light gray (N7), fine grained SILTY SAND, trace clay, wet, (SM)					
16					15.6-16.0 Compact, pale yellowish brown (10YR 6/2), fine grained SAND, damp to moist, (SP)					

END OF BOREHOLE @ 16.0 FEET BGS

PROJECT No	043-9670	LOGGED BY	MSL
PROJECT	Dead Creek Soil to Groundwater Leaching Investigation	CHECKED BY	MSL
LOCATION	Cahokia, Illinois	REVIEWED BY	8/3/2007

LOG OF GEOPROBE BOREHOLE BOREHOLE _____ T 16_____



INVESTIGATION AREA <u>Creek Segment E,</u>	DRILLER Joe Cox		START	FINISH
Transect T16, West of Dead Creek	RIG 6610 Delta T	DATE	7/9/07	7/9/07
	NO. SAMPLES 4	TIME	13:05	13:55
TOTAL DEPTH 15.0 feet Below Ground Surface (BGS)	LOCATION Dead Creek,	BACKFILL TYPE	Bentonite	Pellets
BOREHOLE DIAM. 2.5 inches	Cahokia, Illinois			

DEPTH (Feet)	SAMPLE No.	PID (ppm)	RECOVERY	OTHER	DESCRIPTION AND COMMENTS
		41.			0.0-0.3 <u>ASPHALT</u> 0.3-1.6 Compact, light brown (5YR 6/4) and black (N1), fine grained
	1	0.0	2.9/4.0		GRAVEL and CINDERS, (fill)
4					1.6-5.6 Firm, moderate yellowish brown (10YR 5/4) with dark yellowish brown (10YR 4/2) mottling, <u>SILTY CLAY</u> , damp,
					(CL)
	2	0.0	2.8/4.0		5.6-6.5 Soft, moderate yellowish brown (10YR 5/4), <u>CLAYEY</u> <u>SILT</u> , moist, (MH)
8				▼	6.5-10.8 Firm, moderate yellowish brown (10YR 5/4) with dark yellowish brown (10YR 4/2) mottling, <u>CLAYEY SILT</u> ,
	3	0.0	2.1/4.0	8.60 7/9/07	damp, (MH)
12				13:35	10.8-11.3 Firm, light gray (N7) with black (N1) laminations, SANDY SILT, fine grained, some clay, moist to wet, (ML)
					11.3-15.0 Soft, moderate yellowish brown (10YR 5/4) with dark yellowish brown (10YR 4/2) mottling, SILTY SAND, fine
15	4	0.0	1.2/3.0		grained, wet, (SM)

END OF BOREHOLE @ 15.0 FEET BGS

PROJECT No	043-9670	LOGGED BY	MSL
PROJECT	Dead Creek Soil to Groundwater Leaching Investigation	CHECKED BY	MSL
LOCATION	Cahokia, Illinois	REVIEWED BY	8/3/2007

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1355		9.77	16.66	6.57	773	13.7	
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APPENDIX B

LABORATORY ANALYTICAL REPORTS



ANALYTICAL REPORT

Job Number: 680-28339-1

SDG Number: SDC028

Job Description: Monsanto Dead Creek - Cadmium -July 2007

For:

Golder Associates Inc. 820 South Main Street Suite 100 St. Charles, MO 63301

Attention: MIke Lemon

Lidya Gulizia

Lidya

Project Manager I

lidya.gulizia@testamericainc.com

08/09/2007

cc: Mr. Richard Williams

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory. All questions regarding this test report should be directed to the STL Project Manager who signed this test report.



Job Narrative 680-J28339-1 / SDG No. SDC028

Receipt

All samples were received in good condition within temperature requirements.

Metals

No analytical or quality issues were noted.

Comments

The analysis method on the chain of custody (COC) record was revised to Method 6020 (ICP/MS) from Method 6010 (ICP) following client confirmation.

METHOD SUMMARY

Client: Golder Associates Inc. Job Number: 680-28339-1

Sdg Number: SDC028

Description		Lab Location	Method	Preparation Method
Matrix:	Water			
Inductively Coupled Plasma - Mass Spectrometry		STL SAV	SW846 6020	
Acid Digestion of Waters for Total Recoverable or Sample Filtration performed in the Field		STL SAV STL SAV		SW846 3005A FIELD_FLTRD

LAB REFERENCES:

STL SAV = TestAmerica Savannah

METHOD REFERENCES:

SW846 - "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

METHOD / ANALYST SUMMARY

Client: Golder Associates Inc. Job Number: 680-28339-1

Sdg Number: SDC028

Method	Analyst	Analyst ID	
SW846 6020	Boyuk, Brian	BB	

SAMPLE SUMMARY

Client: Golder Associates Inc. Job Number: 680-28339-1

Sdg Number: SDC028

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
680-28339-1	MW-T7-UNF	Water	07/10/2007 1250	07/12/2007 0925
680-28339-2	MW-T7-10	Water	07/10/2007 1255	07/12/2007 0925
680-28339-3	MW-T7-0.45	Water	07/10/2007 1300	07/12/2007 0925
680-28339-4	MW-T16-UNF	Water	07/11/2007 0920	07/12/2007 0925
680-28339-4MS	MW-T16-UNF	Water	07/11/2007 0920	07/12/2007 0925
680-28339-4MSD	MW-T16-UNF	Water	07/11/2007 0920	07/12/2007 0925
680-28339-5	MW-T16-10	Water	07/11/2007 0925	07/12/2007 0925
680-28339-6	MW-T16-0.45	Water	07/11/2007 0930	07/12/2007 0925
680-28339-7	MW-T2-UNF	Water	07/11/2007 1125	07/12/2007 0925
680-28339-8	MW-T2-10	Water	07/11/2007 1130	07/12/2007 0925
680-28339-9	MW-T2-0.45	Water	07/11/2007 1135	07/12/2007 0925
680-28339-10FD	DUP-1	Water	07/11/2007 0000	07/12/2007 0925
680-28339-11	MW-T6-UNF	Water	07/11/2007 1510	07/12/2007 0925
680-28339-12	MW-T6-10	Water	07/11/2007 1515	07/12/2007 0925
680-28339-13	MW-T6-0.45	Water	07/11/2007 1520	07/12/2007 0925
680-28339-14FD	DUP-2	Water	07/11/2007 0000	07/12/2007 0925

SAMPLE RESULTS

Analytical Data

Job Number: 680-28339-1 Client: Golder Associates Inc.

Sdg Number: SDC028

Client Sample ID: MW-T7-UNF

Lab Sample ID: 680-28339-1 Date Sampled: 07/10/2007 1250 Client Matrix: Water Date Received: 07/12/2007 0925

6020 Inductively Coupled Plasma - Mass Spectrometry-Total Recoverable

Method: 6020 Preparation: 3005A Dilution:

1.0

07/21/2007 0451 Date Analyzed: Date Prepared: 07/19/2007 1611 Analysis Batch: 680-80940

Prep Batch: 680-80650

Instrument ID: Lab File ID:

ICP MS N/A

Initial Weight/Volume: 50 mL Final Weight/Volume: 250 mL

Analyte Result (mg/L) Qualifier MDL RL Cadmium 0.00024 J 0.00012 0.00050

Analytical Data

Client: Golder Associates Inc. Job Number: 680-28339-1

Sdg Number: SDC028

ICP MS

Client Sample ID: MW-T7-10

Date Analyzed: Date Prepared:

 Lab Sample ID:
 680-28339-2
 Date Sampled:
 07/10/2007
 1255

 Client Matrix:
 Water
 Date Received:
 07/12/2007
 0925

6020 Inductively Coupled Plasma - Mass Spectrometry-Dissolved

 Method:
 6020
 Analysis Batch: 680-80940

 Preparation:
 3005A
 Prep Batch: 680-80650

 Dilution:
 1.0

07/19/2007 1611

 3005A
 Prep Batch: 680-80650
 Lab File ID:
 N/A

 1.0
 Initial Weight/Volume:
 50 mL

 07/21/2007 0457
 Final Weight/Volume:
 250 mL

Instrument ID:

Analyte Result (mg/L) Qualifier MDL RL

Cadmium, Dissolved 0.00016 J 0.00012 0.00050

Analytical Data

Job Number: 680-28339-1 Client: Golder Associates Inc.

Sdg Number: SDC028

Client Sample ID: MW-T7-0.45

Lab Sample ID: 680-28339-3 Date Sampled: 07/10/2007 1300 07/12/2007 0925 Client Matrix: Water Date Received:

6020 Inductively Coupled Plasma - Mass Spectrometry-Dissolved

Method: 6020 Preparation: 3005A Dilution:

1.0

07/21/2007 0504 Date Analyzed: Date Prepared: 07/19/2007 1611

Analysis Batch: 680-80940 Prep Batch: 680-80650

Instrument ID: ICP MS Lab File ID: N/A

Initial Weight/Volume: 50 mL Final Weight/Volume: 250 mL

Analyte Result (mg/L) RL Qualifier MDL

Cadmium, Dissolved 0.00017 0.00012 0.00050

Client: Golder Associates Inc. Job Number: 680-28339-1

Sdg Number: SDC028

Client Sample ID: MW-T16-UNF

 Lab Sample ID:
 680-28339-4
 Date Sampled:
 07/11/2007
 0920

 Client Matrix:
 Water
 Date Received:
 07/12/2007
 0925

6020 Inductively Coupled Plasma - Mass Spectrometry-Total Recoverable

Method:6020Analysis Batch: 680-80940Instrument ID:ICP MSPreparation:3005APrep Batch: 680-80650Lab File ID:N/ADilution:1.0Initial Weight/Volume:50 mL

Date Analyzed: 07/21/2007 0511 Final Weight/Volume: 250 mL

Date Prepared: 07/19/2007 1611

Analyte Result (mg/L) Qualifier MDL RL

Cadmium 0.00013 J 0.00012 0.00050

Client: Golder Associates Inc. Job Number: 680-28339-1

Sdg Number: SDC028

ICP MS

N/A

Client Sample ID: MW-T16-10

 Lab Sample ID:
 680-28339-5
 Date Sampled:
 07/11/2007
 0925

 Client Matrix:
 Water
 Date Received:
 07/12/2007
 0925

6020 Inductively Coupled Plasma - Mass Spectrometry-Dissolved

Instrument ID:

Lab File ID:

 Method:
 6020
 Analysis Batch: 680-80940

 Preparation:
 3005A
 Prep Batch: 680-80650

 Dilution:
 1.0

Dilution: 1.0 Initial Weight/Volume: 50 mL
Date Analyzed: 07/21/2007 0559 Final Weight/Volume: 250 mL

Date Prepared: 07/19/2007 1611

Analyte Result (mg/L) Qualifier MDL RL

Cadmium, Dissolved 0.00014 J 0.00012 0.00050

Job Number: 680-28339-1 Client: Golder Associates Inc.

Sdg Number: SDC028

Client Sample ID: MW-T16-0.45

Lab Sample ID: 680-28339-6 Date Sampled: 07/11/2007 0930 07/12/2007 0925 Client Matrix: Water Date Received:

6020 Inductively Coupled Plasma - Mass Spectrometry-Dissolved

Method: 6020 Preparation: 3005A Dilution: 1.0

07/21/2007 0607

07/19/2007 1611

Date Analyzed: Date Prepared: Analysis Batch: 680-80940

Prep Batch: 680-80650

Instrument ID: Lab File ID: Initial Weight/Volume: ICP MS N/A 50 mL

Final Weight/Volume: 250 mL

Analyte Result (mg/L) RL Qualifier MDL

Cadmium, Dissolved 0.00050 0.00012 0.00050

Client: Golder Associates Inc. Job Number: 680-28339-1

Sdg Number: SDC028

Client Sample ID: MW-T2-UNF

 Lab Sample ID:
 680-28339-7
 Date Sampled:
 07/11/2007
 1125

 Client Matrix:
 Water
 Date Received:
 07/12/2007
 0925

6020 Inductively Coupled Plasma - Mass Spectrometry-Total Recoverable

Method:6020Analysis Batch: 680-80940Instrument ID:ICP MSPreparation:3005APrep Batch: 680-80650Lab File ID:N/ADilution:1.0Initial Weight/Volume:50 mL

Date Analyzed: 07/21/2007 0613 Final Weight/Volume: 250 mL

Date Prepared: 07/19/2007 1611

Analyte Result (mg/L) Qualifier MDL RL

 Cadmium
 0.00056
 0.00012
 0.00050

Job Number: 680-28339-1 Client: Golder Associates Inc.

Sdg Number: SDC028

Client Sample ID: MW-T2-10

Lab Sample ID: 680-28339-8 Date Sampled: 07/11/2007 1130 07/12/2007 0925 Client Matrix: Water Date Received:

6020 Inductively Coupled Plasma - Mass Spectrometry-Dissolved

Method: 6020 Preparation: 3005A

Dilution: 1.0

07/21/2007 0620 Date Analyzed: Date Prepared: 07/19/2007 1611

Analysis Batch: 680-80940 Prep Batch: 680-80650

Instrument ID: ICP MS Lab File ID: N/A

Initial Weight/Volume: 50 mL Final Weight/Volume: 250 mL

Analyte Result (mg/L) Qualifier RL MDL

Cadmium, Dissolved 0.00051 0.00012 0.00050

Client: Golder Associates Inc. Job Number: 680-28339-1

Sdg Number: SDC028

Client Sample ID: MW-T2-0.45

 Lab Sample ID:
 680-28339-9
 Date Sampled:
 07/11/2007 1135

 Client Matrix:
 Water
 Date Received:
 07/12/2007 0925

6020 Inductively Coupled Plasma - Mass Spectrometry-Dissolved

Method: 6020 Preparation: 3005A Dilution: 1.0

1.0 ed: 07/21/2007 0627

Date Analyzed: 07/21/2007 0627 Date Prepared: 07/19/2007 1611 Analysis Batch: 680-80940 Instrument ID: ICP MS
Prep Batch: 680-80650 Lab File ID: N/A

Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 250 mL

Analyte Result (mg/L) Qualifier MDL RL

Cadmium, Dissolved 0.00058 0.00012 0.00050

Client: Golder Associates Inc. Job Number: 680-28339-1

Sdg Number: SDC028

ICP MS

N/A

Client Sample ID: DUP-1

 Lab Sample ID:
 680-28339-10FD
 Date Sampled:
 07/11/2007
 0000

 Client Matrix:
 Water
 Date Received:
 07/12/2007
 0925

6020 Inductively Coupled Plasma - Mass Spectrometry-Total Recoverable

Method:6020Analysis Batch: 680-80940Instrument ID:Preparation:3005APrep Batch: 680-80650Lab File ID:Dilution:1.0Initial Weight/Volume:

 Dilution:
 1.0
 Initial Weight/Volume:
 50 mL

 Date Analyzed:
 07/21/2007 0634
 Final Weight/Volume:
 250 mL

 Date Prepared:
 07/19/2007 1611

Analyte Result (mg/L) Qualifier MDL RL

Client: Golder Associates Inc. Job Number: 680-28339-1

Sdg Number: SDC028

Client Sample ID: MW-T6-UNF

 Lab Sample ID:
 680-28339-11
 Date Sampled:
 07/11/2007
 1510

 Client Matrix:
 Water
 Date Received:
 07/12/2007
 0925

6020 Inductively Coupled Plasma - Mass Spectrometry-Total Recoverable

Method:6020Analysis Batch: 680-80940Instrument ID:ICP MSPreparation:3005APrep Batch: 680-80650Lab File ID:N/ADilution:1.0Initial Weight/Volume:50 mL

Date Analyzed: 07/21/2007 0641 Final Weight/Volume: 250 mL Date Prepared: 07/19/2007 1611

 Analyte
 Result (mg/L)
 Qualifier
 MDL
 RL

 Cadmium
 0.00015
 J
 0.00012
 0.00050

Job Number: 680-28339-1 Client: Golder Associates Inc.

Sdg Number: SDC028

ICP MS

Client Sample ID: MW-T6-10

Lab Sample ID: 680-28339-12 Date Sampled: 07/11/2007 1515 07/12/2007 0925 Client Matrix: Water Date Received:

6020 Inductively Coupled Plasma - Mass Spectrometry-Dissolved

Method: 6020 Analysis Batch: 680-80940 Instrument ID: Preparation: 3005A Prep Batch: 680-80650 Lab File ID: Dilution: 1.0

N/A Initial Weight/Volume: 50 mL Final Weight/Volume: 250 mL

Date Analyzed: Date Prepared: 07/19/2007 1611

07/21/2007 0648

Analyte Result (mg/L) RL Qualifier MDL Cadmium, Dissolved 0.00050 0.00012 0.00050

Job Number: 680-28339-1 Client: Golder Associates Inc.

Sdg Number: SDC028

ICP MS

Client Sample ID: MW-T6-0.45

Lab Sample ID: 680-28339-13 Date Sampled: 07/11/2007 1520 07/12/2007 0925 Client Matrix: Water Date Received:

6020 Inductively Coupled Plasma - Mass Spectrometry-Dissolved

Method: 6020 Preparation: 3005A Dilution: 1.0

07/21/2007 0655 Date Analyzed:

Date Prepared: 07/19/2007 1611 Analysis Batch: 680-80940 Instrument ID: Prep Batch: 680-80650

Lab File ID: N/A Initial Weight/Volume: 50 mL Final Weight/Volume: 250 mL

Analyte Result (mg/L) RL Qualifier MDL

Cadmium, Dissolved 0.00050 0.00012 0.00050

Client: Golder Associates Inc. Job Number: 680-28339-1

Sdg Number: SDC028

Client Sample ID: DUP-2

 Lab Sample ID:
 680-28339-14FD
 Date Sampled:
 07/11/2007 0000

 Client Matrix:
 Water
 Date Received:
 07/12/2007 0925

6020 Inductively Coupled Plasma - Mass Spectrometry-Dissolved

Method:6020Analysis Batch: 680-80940Instrument ID:ICP MSPreparation:3005APrep Batch: 680-80650Lab File ID:N/ADilution:1.0Initial Weight/Volume:50 mL

Date Analyzed: 07/21/2007 0716 Final Weight/Volume: 250 mL

Date Prepared: 07/19/2007 1611

 Analyte
 Result (mg/L)
 Qualifier
 MDL
 RL

 Cadmium, Dissolved
 0.00013
 J
 0.00012
 0.00050

DATA REPORTING QUALIFIERS

Client: Golder Associates Inc. Job Number: 680-28339-1

Sdg Number: SDC028

Lab Section	Qualifier	Description
Metals		
	U	Indicates the analyte was analyzed for but not detected.
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

QUALITY CONTROL RESULTS

Client: Golder Associates Inc. Job Number: 680-28339-1

Sdg Number: SDC028

QC Association Summary

		Report			
Lab Sample ID	Client Sample ID	Basis	Client Matrix	Method	Prep Batch
Metals					
Prep Batch: 680-80650					
LCS 680-80650/17-A	Lab Control Spike	R	Water	3005A	
MB 680-80650/16-A	Method Blank	R	Water	3005A	
680-28339-1	MW-T7-UNF	R	Water	3005A	
680-28339-2	MW-T7-10	D	Water	3005A	
680-28339-3	MW-T7-0.45	D	Water	3005A	
680-28339-4	MW-T16-UNF	R	Water	3005A	
680-28339-4MS	Matrix Spike	R	Water	3005A	
680-28339-4MS	Matrix Spike	R	Water	3005A	
680-28339-4MSD	Matrix Spike Duplicate	R	Water	3005A	
680-28339-4MSD	Matrix Spike Duplicate	R	Water	3005A	
680-28339-5	MW-T16-10	D	Water	3005A	
680-28339-6	MW-T16-0.45	D	Water	3005A	
680-28339-7	MW-T2-UNF	R	Water	3005A	
680-28339-8	MW-T2-10	D	Water	3005A	
680-28339-9	MW-T2-0.45	D	Water	3005A	
680-28339-10FD	DUP-1	R	Water	3005A	
680-28339-11	MW-T6-UNF	R	Water	3005A	
680-28339-12	MW-T6-10	D	Water	3005A	
680-28339-13	MW-T6-0.45	D	Water	3005A	
680-28339-14FD	DUP-2	D	Water	3005A	
	_				
Analysis Batch:680-8094 LCS 680-80650/17-A	u Lab Control Spike	R	Water	6020	680-80650
MB 680-80650/16-A	Method Blank	R	Water	6020	680-80650
680-28339-1	MW-T7-UNF	R	Water	6020	680-80650
680-28339-2	MW-T7-10	D	Water	6020	680-80650
680-28339-3	MW-T7-0.45	D	Water	6020	680-80650
680-28339-4	MW-T16-UNF	R	Water	6020	680-80650
680-28339-4MS	Matrix Spike	R	Water	6020	680-80650
680-28339-4MS	Matrix Spike	R	Water	6020	680-80650
680-28339-4MSD	Matrix Spike Duplicate	R	Water	6020	680-80650
680-28339-4MSD	Matrix Spike Duplicate	R	Water	6020	680-80650
680-28339-5	MW-T16-10	D	Water	6020	680-80650
680-28339-6	MW-T16-10 MW-T16-0.45	D	Water	6020	680-80650
680-28339-7		R	Water	6020	680-80650
	MW-T2-UNF MW-T2-10	D	Water	6020	680-80650
680-28339-8 680-28339-9	MW-T2-10 MW-T2-0.45	D		6020	680-80650
680-28339-10FD	DUP-1	R	Water Water	6020	680-80650
680-28339-10FD	MW-T6-UNF	R	Water	6020	680-80650
580-28339-11 580-28339-12	MW-16-0NF MW-T6-10	R D	Water	6020	680-80650
680-28339-13	MW-T6-0.45	D	Water	6020	680-80650
880-28339-14FD	DUP-2	D	Water	6020	680-80650

Quality Control Results

Client: Golder Associates Inc. Job Number: 680-28339-1

Sdg Number: SDC028

QC Association Summary

Report

 Lab Sample ID
 Basis
 Client Matrix
 Method
 Prep Batch

Report Basis

D = Dissolved

R = Total Recoverable

Quality Control Results

Client: Golder Associates Inc.

Job Number: 680-28339-1

Sdg Number: SDC028

Method Blank - Batch: 680-80650 Method: 6020

Preparation: 3005A Total Recoverable

Lab Sample ID: MB 680-80650/16-A

Client Matrix: Water
Dilution: 1.0

Date Analyzed: 07/21/2007 0430 Date Prepared: 07/19/2007 1611 Analysis Batch: 680-80940 Prep Batch: 680-80650

Units: mg/L

Instrument ID: ICP MS Lab File ID: N/A

Initial Weight/Volume: 50 mL Final Weight/Volume: 250 mL

Analyte	Result	Qual	MDL	RL
Cadmium	0.00050	U	0.00012	0.00050
Cadmium, Dissolved	0.00050	U	0.00012	0.00050

Lab Control Spike - Batch: 680-80650 Method: 6020

Preparation: 3005A Total Recoverable

Lab Sample ID: LCS 680-80650/17-A

Client Matrix: Water Dilution: 1.0

Date Analyzed: 07/21/2007 0437 Date Prepared: 07/19/2007 1611 Analysis Batch: 680-80940 Prep Batch: 680-80650

Units: mg/L

Instrument ID: ICP MS Lab File ID: N/A

Initial Weight/Volume: 50 mL Final Weight/Volume: 250 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Cadmium	0.0500	0.0473	95	75 - 125	
Cadmium, Dissolved	0.0500	0.0473	95	75 - 125	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

50 mL

Client: Golder Associates Inc.

Job Number: 680-28339-1

Sdg Number: SDC028

Matrix Spike/ Method: 6020
Matrix Spike Duplicate Recovery Report - Batch: 680-80650 Preparation: 3005A

Total Recoverable

Initial Weight/Volume:

MS Lab Sample ID: 680-28339-4 Analysis Batch: 680-80940 Instrument ID: ICP MS Client Matrix: Water Prep Batch: 680-80650 Lab File ID: N/A

Dilution: 1.0

 Date Analyzed:
 07/21/2007
 0532
 Final Weight/Volume:
 250 mL

 Date Prepared:
 07/19/2007
 1611

MSD Lab Sample ID: 680-28339-4 Analysis Batch: 680-80940 Instrument ID: ICP MS Client Matrix: Water Prep Batch: 680-80650 Lab File ID: N/A

Dilution: 1.0 Initial Weight/Volume: 50 mL

 Date Analyzed:
 07/21/2007 0553
 Final Weight/Volume:
 250 mL

 Date Prepared:
 07/19/2007 1611
 Total Veight/Volume:
 250 mL

% Rec. RPD Analyte MS MSD Limit **RPD Limit** MS Qual MSD Qual Cadmium 95 95 75 - 125 1 20 Cadmium, Dissolved 95 95 75 - 125 1 20

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\	PAGE	REQUIRED ANALYSIS	REQUIR			MATRIX TYPE	PROJECT LOCATION (STATE)	1670	PROJECT NO.		RENCE	M REFERENCE
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	REQUIRED ANALYSIS	REQUIREC			MATRIX TYPE	PROJECT LOCATION (STATE) 72	PROJECT NO. 6-13-8670	CREEK PR	PEAO.	MONSANTO L
	ation Phone: Fax:	ry Name/Loc	Alternate Laboratory Name/Location	Alte				U	TRENT	
Website: www.stl-inc.com Phone: (912) 354-7858 Fax: (912) 352-0165	Website: www.stl-inc.cor Phone: (912) 354-7858 Fax: (912) 352-0165	Avenue 1404	5 STL Savannah 5102 LaRoche Ave Savannah, GA 314	\$10 Sav		OF CUSTODY RE	ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD	ANALYSIS RE	VERN	SEV
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LOGIN SAMPLE RECEIPT CHECK LIST

Client: Golder Associates Inc. Job Number: 680-28339-1

Sdg Number: SDC028

Login Number: 28339

Question	T/F/NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	NA	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	3.8 C
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	NA	
Samples do not require splitting or compositing.	NA	

APPENDIX C

DATA VALIDATION REPORTS

Project Review Labora		 	Proje Valid		ager: Mark Haddock ber: 043-9670 ate: 08/13/07 SDC 028
Matrix:	☐ Air ☐ Soil/Sed. ☑ Water ☐ Waste	ุ □ .			
	Names <u>MW-T7-UNF</u> , MW-T7-1(N-776-D.45, MW-T2-UNF, MW				D-D45 DDP-1 NIM-TIM-10.
	1-Th-10 MW-Tb-045, DUP	<u>- 12</u> -7	3-10,1	1W-	12-0.45, DUP-1, MW-TU-UN
	Please provide calculation in Comment areas or	on the	e back (if (on the h	ack please indicate in comment areas)
	nformation	YES	NO NO	NA	COMMENTS
a)	Sampling dates noted?				COMMEN 13
b)	Sampling dates noted: Sampling team indicated?				
c)	Sample location noted?	[]X			
d)	Sample depth indicated (Soils)?	□ □	П		
e)	Sample type indicated (grab/composite)?	□ Ø		⁄تھ <u>ر</u> □	A-OUL OUS
f)	Field QC noted?				Aqueous
y g)	Field parameters collected (note types)?		П		
9) h)	Field Calibration within control limits?				
i)	Notations of unacceptable field conditions/performa	ப nces f	irom field lo	nas or fie	ld notes?
'/	retations of unacceptable field conditions/performa	cc3		,g3 01 110 □	id notes:
j)	Does the laboratory narrative indicate deficiencies?			Ø	-
,,	Note Deficiencies:				
Chain-	of-Custody (COC)	YES	NO	NA	COMMENTS
a)	Was the COC properly completed?				
b)	Was the COC signed by both field and laboratory personnel?	K)			
c)	Were samples received in good condition?	A			
Genera	I (reference QAPP or Method)	YES	NO	NA	COMMENTS
a)	Were hold times met for sample pretreatment?				
b)	Were hold times met for sample analysis?	(X)			
c)	Were the correct preservatives used?	$\sqrt{2}$			
d)	Was the correct method used?	Ø			
e)	Were appropriate reporting limits achieved?				
f)	Were any sample dilutions noted?				
g)	Were any matrix problems noted?		72		

Calibr	ation Verification (ICV/CCV)	YES	NO	NA	COMMENTS
a)	Complete for all target metals and CN?				
b)	ICV criteria achieved?	Ф			
c)	CCV criteria achieved?	及			
d)	CCV analyzed every 2 hours or 10 samples?	囟			
e)	CRDL standard analyzed for ICP and AA?	Ø			(not necessarily required for SW846)
f)	If analyzed, run at appropriate frequency?	Ø			
g)	If analyzed, within control limits?	Ź			%R=9870
Blank	s	YES	NO	NA	COMMENTS
a)		Ø			
b)			<u> </u>		
c)	ICB/CCB for all target metals and CN?				
d)	ICB criteria achieved?	$ \overline{\mathbb{Q}} $			
e)	000 11 11 10	$\overline{\mathbb{Z}}$			
f)	CCB analyzed every 2 hours or 10 samples?	<u> </u>			
g)	Were analytes detected in the field/equip blank(s)?			Ø	
Matrix	Spike/Matrix Spike Duplicate (MS/MSD)	YES	NO	NA	COMMENTS
a)	Was MS accuracy criteria met (note %R)?				
	Recovery could not be calculated since sample contained high concentration of analyte?			Þ	
b)	Was MSD accuracy criteria met (note %R)?			区	
	Recovery could not be calculated since sample contained high concentration of analyte?			\boxtimes	
c)	Were MS/MSD precision criteria met (note RPD)?			\Box	
Labora	atory Control Sample (LCS)	YES	NO	NA	COMMENTS
d)	Was a LCS analyzed once per SDG?)ZÍ			
e)	Were the proper analytes included in the LCS?	Ø			
f)	Was the LCS accuracy criteria met?				
Duplic	ates (Lab and Field)	YES	NO	NA	COMMENTS
g)	Were field duplicates collected (note original and du	uplicate	sample n	ames)?	MW-T2-UNF/DUP-1; MW-T6-0,45/DUP-2
		区			- 1
h)	Were field dup, precision criteria met (note RPD)?	Ø			RPD < 200%
i)	Were lab duplicates analyzed (note original and du	olicate s	samples)?)	
		Ø			MW-T16-UNFSD
iλ	Were lab dup precision criteria met (note RPD)?	ÌΉ	П	П	RPD < 200/2

ICP Se	rial Dilution	YES	NO	NA	COMMENTS
a)	Was a ICP SD analyzed once per SDG?	Ø			
b)	Was the ICP SD criteria met?		Ø		90D > 10070
Blind S	standards	YES	NO	NA	COMMENTS
a)	Was a blind standard used (indicate name,			^\ \	
	analytes included and concentrations)?	_		<i></i>	
b)	Was the %D within control limits?			P	
Split Sa	ample Results	YES	NO	NA	COMMENTS
a)	Were split samples collected (indicate IDs)?			N N	
b)	Were the split sample results within criteria?			A	
	ents/Notes: all ZMDL quali	fred	U)	\ \\A	non-detected qualified
[of UT because ICP	<u>SP</u>	*/ ₀ \(\bullet	> >100	?o. '

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Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
MW-T16-Q45 MW-T2-UNF	Cadmium		UJ	1CP SD %>10%
MW-T2-UNF	n constant		and the same	\
MW-T2-10 MW-T2-045			7	
MW-T2-045	,		5	
DUP-1	78.00.00 to		J	
MW-76-10 MW-76-0.45	tresamptific of		U,J	The state of the s
NW-T6-0.45	or new West, and		UJ	1
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